

Application Serial No. 10/628,651
Response dated August 18, 2006
Reply to Office Action mailed May 18, 2006

REMARKS

The Examiner has rejected claims 1, 5-7, 22, 25 and 35-42 under 35 U.S.C. § 103 as being unpatentable over PL 149319 in view of CN 1060052. Claims 35-42 are rejected under § 103 as being unpatentable over EP 465861 in view of CN 1060052. Claims 22, 25, and 35-42 are rejected under § 103 as being unpatentable over SU 1706816 in view of CN 1060052. Claims 22 and 25 are rejected under § 103 as being unpatentable over CN 1060052. Claims 1, 5, and 22 are rejected under § 103 as being unpatentable over U.S. Patent No. 3,674,471 to Joseph.

Although not specifically stated in the present office action, Examiner has removed the following rejections from the last office action: (1) Claims 39-42 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement; (2) Claims 35-42 under § 103 over CN 1060052; and (3) Claims 35-42 under § 103 over Joseph.

New claims 43 and 44 are added herein. These claims depend from claims 1 and 22 respectively, and contain the proviso recited in claims 35 and 39. It is asserted that the addition of these new claims does not require further search and consideration because the proviso has already been considered in view of the art. Entry of the amendment is requested.

Submitted herewith is a fourth affidavit from Robert Henson that addresses points raised by Examiner in the final Office Action dated May 18, 2006. The record of the instant application contains numerous test alloys, and an oversimplification was made in the attempt to explain the voluminous data. Thus, Mr. Henson's Fourth Affidavit is submitted to clarify prior statements (or partial misstatements).

With respect to Alloy F, Examiner's attention is brought to MPEP 2164.08(b). Applicant has provided numerous examples throughout the present application, including the applications within the family incorporated by reference, of alloys that fall within the scope of claims 1, 35, and/or 39 and which are operable. (See Table A submitted February 27, 2006, which is a compilation of specific alloys disclosed in the record of the instant application.) Applicant has further provided in the specification ample discussion to enable one skilled in the

art to practice the invention. Thus, while Alloy F has a tin content within the scope of claim 1, and an antimony content within the scope of claim 1, the alloy is not considered to be ideal due to the fact that the combined tin and antimony content exceeds 10%. Alloys I, J, and K admittedly do not fall within the scope of claim 1, but numerous alloys of the present invention are provided in that Table A that do fall within the scope of claim 1. In addition, Alloys I, J, and K as well as numerous other alloys in Table A do fall within the scope of claims 35 and 39. The purpose of Alloys I and J was to test the alloy near the endpoints of the claimed ranges for P and Sn, without regard to the presence of silver (which is required in Claim 1 but optional in claims 35 and 39) to show the criticality of the ranges for those two elements. The presence or lack of presence of silver does not effect that criticality. The purpose of Alloy K was to provide an exemplary embodiment of the invention of claims 35 and 39, without silver. In its totality, the evidence that has been provided serves to demonstrate the effect of varying certain elements relative to others. This evidence, considered as a whole, rather than fixating on one or a few particular alloys, demonstrate criticality of the various narrow ranges claimed in claims 1, 22, 35 and 39.

The fact that Alloy F falls within the literal scope of claim 1 but is deemed not desirable for the present invention due to its high combined Sn/Sb content does not render Mr. Henson's testing questionable. Mr. Henson has clearly demonstrated that alloys throughout the range of the Polish Abstract, in paste form as taught by the Abstract, cannot form brazed joints. That evidence is sufficient to demonstrate inoperability of the reference. Mr. Henson took the testing a step further, and even tried to add a commercial flux in the event that the Carrier does not also function as a flux, and a brazed joint could still not be formed as alleged by the reference. Mr. Henson also attempted to form a braze joint using a powder of the sole specific alloy composition provided by the Polish Abstract, and yet again, no brazed joint could be formed. Again, this evidence should be considered sufficient to prove inoperability of the Polish Abstract.

Once again, while the recited solid forms may be conventional for solder

compositions, solder compositions are different than brazing compositions. It is well known that solder alloys are more malleable than braze alloys, such that solders are more easily formed into solid shapes. While both solders and brazes are in the same field of endeavor to the extent they are both useful for joining metals, the differences between solders and brazes are germane to the invention. Brazes and solders are designed to operate in different temperature ranges, and have different elements and properties that affect the operating temperature and the formability of the alloys. Thus, solders are directed to a different class of materials within the field of metal-joining compositions. The present invention focuses in one regard on alloys that maintain the operating temperature for a brazing alloy, but provide more formability than other braze alloys. Solders do not have the same problem as brazes with formability—they are generally malleable. The very difference between the two classes of materials makes solders not relevant to the claimed invention. Therefore, the fact that solder alloys of the CN Abstract can be formed into solid forms, and that those forms are conventional for solder alloys, does not render obvious the claimed invention because the claimed invention is directed to braze alloys. It is respectfully asserted that all rejections using the CN Abstract should be withdrawn.

With respect to claims 35-42, EP 465861 does not teach or suggest the claimed forms of the brazing components, nor the temperatures for the solidus, liquidus and major thermal arrest. As shown by the ample evidence submitted to date, variations in composition have a marked affect on the temperature profile. Numerous examples have been provided, yet Examiner states that the burden is on the Applicant to prove that the properties are not inherently possessed by the prior art. Applicant has proven that the claimed properties are not inherent in the broad teachings of the prior art. EP 465861 also does not teach or suggest the proviso that the sum of tin and antimony not exceed about 10%, which proviso is recited in each of the rejected claims. Further, the Chinese Abstract does not teach or suggest modifications to the composition or forms of a brazing alloy since it is directed to solder compositions. It is therefore respectfully requested that the rejection of claims 35-42 over the EP 465861 in view of the Chinese Abstract be withdrawn.

Application Serial No. 10/628,651
Response dated August 18, 2006
Reply to Office Action mailed May 18, 2006

Examiner did not comment on Applicants arguments with respect to SU 1706816. SU 1706816 (the Russian Abstract) discloses changes in the shrinkage porosity and strength of a braze joint by the inclusion in the braze alloy of 0.5-1.5 wt.% In and 1.0-4.5 wt.% Si. The Russian Abstract admits that the inclusion of In has an affect on at least two material properties of the alloy. Thus, Applicant does not have to prove that the additional element would have a material affect, because the reference admits it. With respect to claim 39, which uses "consists of," Applicant need not prove anything regardless of "material effect" because the element is automatically excluded. Examiner has given no response to Applicants arguments regarding the Russian Abstract, and no justification or reasoning for maintaining the rejection. It is respectfully asserted that the rejections based on the Russian Abstract are improper, and therefore, should be withdrawn.

In view of the foregoing remarks given herein, Applicants respectfully believe this case is in condition for allowance and respectfully request allowance of the pending claims. If the Examiner believes any detailed language of the claims requires further discussion, the Examiner is respectfully asked to telephone the undersigned attorney so that the matter may be promptly resolved. The Examiner's prompt attention to this matter is appreciated.

Applicants are of the opinion that no additional fee is due as a result of this Amendment. If any charges or credits are necessary to complete this communication, please apply them to Deposit Account No. 23-3000.

Respectfully submitted,
WOOD, HERRON & EVANS, L.L.P.

By: /Kristi L. Davidson/
Kristi L. Davidson, Reg. No. 44,643

2700 Carew Tower
441 Vine Street
Cincinnati, OH 45202
(513) 241-2324 (voice)
(513) 241-6234 (facsimile)
K:\UWH\59US\response to 05-18-06 FI OA.wpd